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ABSTRACT

These item specifications were developed as a part of the Arkansas "Minimum Performance Testing Program" (MPT). There is one item specification for each instructional objective included in the MPT. The purpose of an item specification is to provide an overview of the general content and format of test items used to measure an instructional objective. Specifically, each item contains: (1) an objective identification number; (2) grade level; (3) subject area; (4) goal identification; (5) skill description; (6) stimulus attributes; (7) response attributes; and (8) sample items. It is suggested that teachers may use these specifications in a variety of ways. Teachers may use them as a guide in the development of evaluation instruments to check student performance, inform parents about what their child will face on the MPT, and familiarize their students with the MPT. Covered in this guide are items which test: living and nonliving matter; heredity and change; human body; development of plants and animals; plant and animal behavior; plants; vertebrates and invertebrates; food chains; environment; rocks, minerals and fossils; changes in the earth's crust; weather; universe; natural resources; pollution; water cycle; matter; elements, mixtures and compounds; air; sources of energy; heat; electric circuits; electromagnetism; electrical insulators and conductors; convex and concave lenses; reflection and refraction of light; and machines. (CW)

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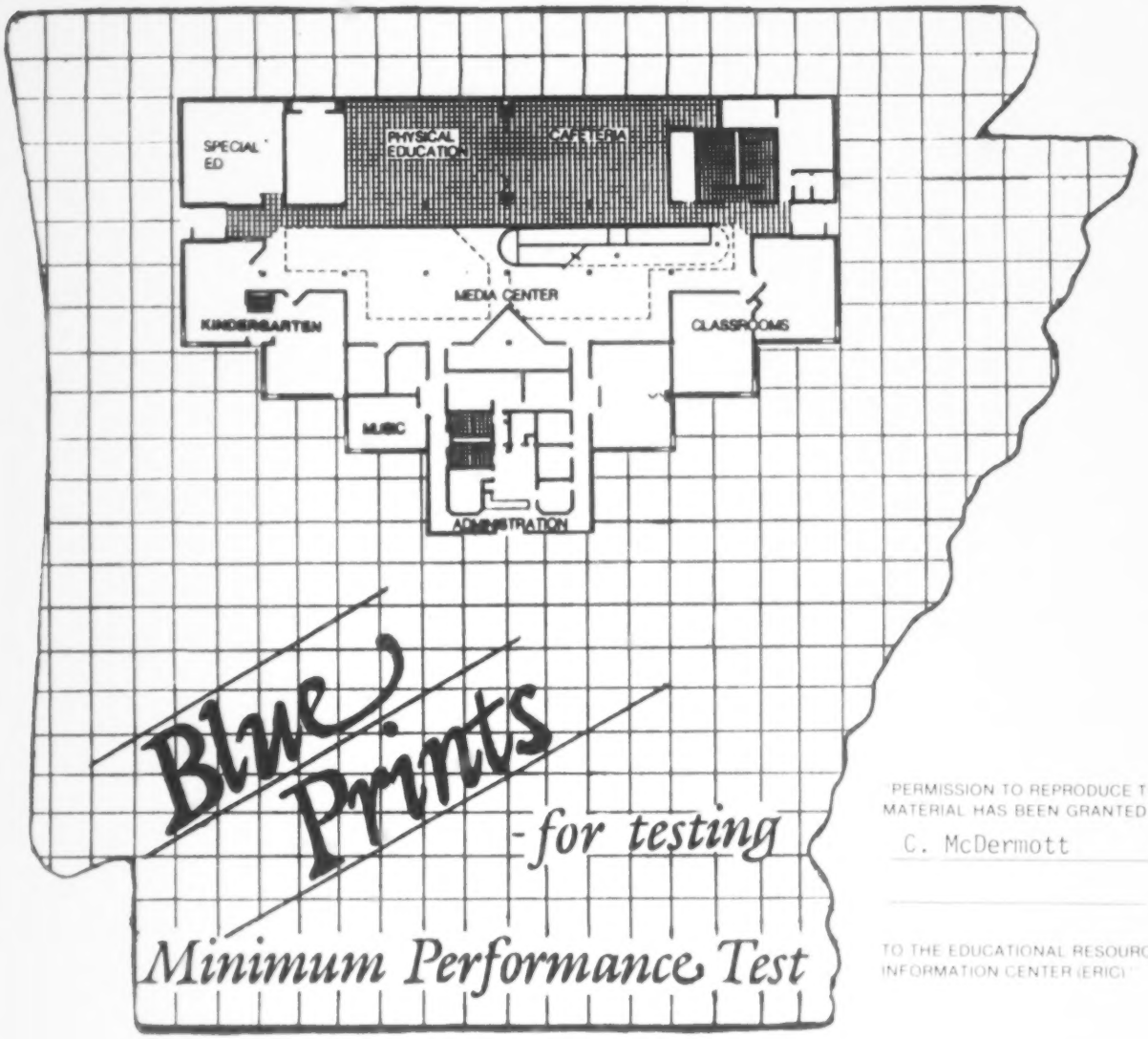

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Item Specifications

Science
Grade 6

ED325846
SE051 687

INTRODUCTION

These Item Specifications were developed by the Department of Education as part of the Arkansas Minimum Performance Testing Program (MPT). There is one Item Specification for each instructional objective included in the MPT. While all objectives are not necessarily tested every year, every objective included here may appear in the MPT.

The purpose of an Item Specification is to provide an overview of the general content and format of test items used to measure an instructional objective. Specifically, each Item Specification contains the following information:

* *Objective Identification Number*
* *Grade Level*
* *Subject Area*
* *Goal Identification*
* *Skill Description*
* *Stimulus Attributes (Format, Content, Directions)*
* *Response Attributes (Format, Content, Directions)*
* *Sample Item(s)*

The first five elements listed above are consistently labeled and defined to correspond with the Teachers' Guide and MPT materials. The Stimulus Attributes section contains information about the item stem (the question of incomplete statement that makes up the test question). Similarly, the Response Attributes section contains information about the correct answer and about possible incorrect answers. The Sample Item section provides examples of a test item or items which are similar to the items which may appear on the MPT.

These Item Specifications may be used in a variety of ways. Teachers may use them to guide them in the development of information evaluation instruments to determine whether or not students have mastered specific objectives. Teachers may also use these Item Specifications to inform parents about what their children will experience when they take the MPT. Teachers may also use these Item Specifications to familiarize students with what to expect on the MPT.

School administrators may used these Item Specifications when they communicate to the public about the MPT. The sample items may be useful in illustrating what mastery of an objective means.

It is important to understand that use of these Item Specifications does not in any way invalidate the MPT. None of the test items on these Item Specifications have appeared or will ever appear on the MPT. Using these Item Specifications in the classroom or as part of the instructional process is **NOT** teaching the test!

OBJECTIVE: 2.1

GRADES 4-6: SCIENCE **GOAL: LIVING AND NONLIVING**

SKILL: Identify characteristics of living and nonliving matter.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence dealing with the characteristics of living and nonliving matter

Type 2 a direct question asking for the identification of living or nonliving matter

B. Content

Types 1 and 2 N/A

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four words or phrases describing characteristics of living and nonliving matter listed vertically from short to long

Type 2 four illustrations or examples of living and nonliving matter

B. Options

Type 1 correct response: the word or phrase requested in the stimulus question
distractors: other plausible words or phrases

Type 2 correct response: the illustration or example requested in the stimulus question
distractors: other illustrations or examples

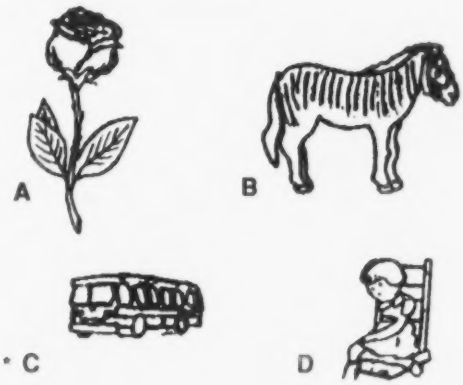
SAMPLE ITEM: *Type 1*

1. All living things do all the following EXCEPT:

A grow.
B reproduce.
• C form crystals.
D respond to the world.

SAMPLE ITEM: *Type 2*

2. Which is NOT living?



OBJECTIVE: 3.1

GRADES: 4-6 SCIENCE **GOAL: HEREDITY AND CHANGE**

SKILL: Choose the correct definition of heredity and the following terms associated with heredity and change: genes, chromosomes, sex cells and DNA (Deoxyribonucleic Acid).

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question or incomplete sentence which includes a definition and requires a term

Type 2 a direct question or an incomplete sentence which includes a term and requires a definition or example

B. Content

Types 1 and 2 terms and definitions from the skill list

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four words or terms, listed vertically from short to long

Type 2 four definitional phrases, listed vertically from short to long

B. Options

Type 1 correct response: the term requested in the stimulus definition
distractors: other related science terms

Type 2 correct response: the definition of the stimulus term
distractors: definitions of other related science terms

SAMPLE ITEM: *Type 1*

1. **What part of the chromosome carries information needed to form each trait in a new individual?**

   A atom
   * B gene
   C plasma
   D cytoplasm

SAMPLE ITEM: *Type 2*

2. **What is an example of heredity?**

   A an animal that eats plants
   B the process by which cells divide
   C a team of cells that does a special job
   *D the passing of traits from parents to offspring

OBJECTIVE: 4.2

GRADES 4-6: SCIENCE **GOAL: HUMAN BODY**

SKILL: Identify the function of the nine body systems listed in skill 4.1 (respiratory, skeletal, muscular, circulatory, digestive, nervous, excretory, endocrine and reproductive).

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence or direct question describing a function of a body system and requiring the name of the system to complete the sentence

Type 2 an incomplete sentence containing the name of a body system and requiring the system function to complete the sentence

B. Content

Types 1 and 2 limited to the nine body systems listed in the skill

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four names of body systems listed vertically from short to long

Type 2 four body system functions listed vertically from short to long

B. Options

Type 1 correct response: the name of the body system requested in the stimulus
distractors: the names of other body systems

Type 2 correct response: the function of the stimulus body system
distractors: functions of other body systems

SAMPLE ITEM: *Type 1*

1. Which system moves blood throughout the body?

A muscular
*B circulatory
C respiratory
D reproductive

SAMPLE ITEM: *Type 2*

2. The respiratory system:

A reproduces life.
B supports the body.
C coordinates and controls the body.
* D exchanges oxygen and carbon dioxide.

OBJECTIVE: 5.1

GRADES 4-6: SCIENCE **GOAL: DEVELOPMENT OF PLANTS AND ANIMALS**

SKILL: Choose the correct sequence of the developmental stages in the life cycle of a plant or animal.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a numbered illustration of the developmental stages in the life cycle of a plant or animal followed by a direct question such as: Which sequence of numbers CORRECTLY identifies the stages in which a plant develops?

Type 2 a direct question such as: Which illustration CORRECTLY identifies the sequence of the life cycle of a plant (animal)?

B. Content

Type 1 illustration in non-sequential order

Type 2 N/A

C. Directions

Type 1 Refer to the illustration to answer question ( ).

Type 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four sets of numbers (1, 2, 3, 4) in different orders listed vertically

Type 2 four illustrations or lists depicting the developmental stages in the life cycle of a plant or animal in different order

B. Options

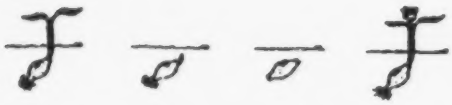
Type 1 correct response: the set of numbers which correctly identifies the life cycle sequence requested in the stimulus
distractors: other sets of the same numbers

Type 2 correct response: the illustration or list which correctly identifies the stages in the life cycle requested in the stimulus question
distractors: other illustrations or list of the same life cycle

OBJECTIVE: 5.1 (cont.)

SAMPLE ITEM: ***Type 1***

1. Which sequence of numbers CORRECTLY identifies the stages in which a plant develops?

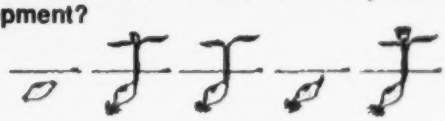


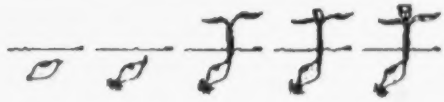
1 2 3 4

A 1, 2, 3, 4
* B 3, 2, 1, 4
C 3, 1, 4, 2
D 2, 3, 4, 1

SAMPLE ITEM: ***Type 2***

2. Which shows the CORRECT order of plant development?

A 

* B 

C

D

OBJECTIVE: 6.1

GRADES 4-6: SCIENCE **GOAL: PLANT AND ANIMAL BEHAVIOR**

SKILL: Choose the definition of the following terms as they apply to plant and animal behavior: stimulus, instinct, response and conditioning.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence which includes an example of plant or animal behavior or requires a term

Type 2 an incomplete sentence or direct question which includes a definition of plant or animal behavior and requires a term

B. Content

Types 1 and 2 terms from the skill list

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format four terms listed vertically from short to long

B. Options correct response: the term requested in the stimulus
distractors: related science terms in the same form as the correct response

---

SAMPLE ITEM: *Type 1*

1. **Pulling your hand away from a hot stove is an example of a(n):**

   A instinct.
   B stimulus.
   * C response.
   D conditioning.

SAMPLE ITEM: *Type 2*

2. **What causes a reaction from a plant or animal?**

   A instinct
   * B stimulus
   C response
   D conditioning

OBJECTIVE: 7.2

GRADES 4-6: SCIENCE **GOAL: PLANTS**

SKILL: Identify parts of a flowering plant using an illustration.

STIMULUS ATTRIBUTES:

A. Format an illustration of a common plant followed by a direct question such as: Which identifies number _____?

B. Content parts of the plant in the illustration labeled with numbers and limited to the stem, leaf, root, flower, seed and berries

C. Directions Use the illustration to answer question ( ).

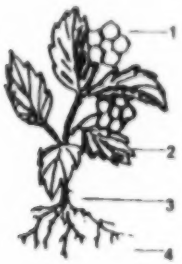
RESPONSE ATTRIBUTES:

A. Format four names of parts of a flowering plant listed vertically from short to long

B. Options correct response: the name of the plant part requested in the stimulus question
distractors: names of other plant parts

SAMPLE ITEM:

Use the illustration below to answer question 1.



1. Which identifies number 2?

A stem
• B leaf
C root
D flower

OBJECTIVE: 7.3

GRADES 4-6: SCIENCE **GOAL: PLANTS**

SKILL: Match the parts of the plant to the appropriate function.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question or an incomplete sentence such as: The part of a plant which anchors it in the soil and stores the food is the:

Type 2 an incomplete sentence or a direct question such as: Which is a function of the root of a plant?

B. Content

Types 1 and 2 plant parts limited to roots, stem, leaf, flower

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four names of parts of a plant listed vertically from short to long

Type 2 four functions of the parts of a plant listed vertically from short to long

B. Options

Type 1 correct response: the name of the part of a plant requested in the stimulus
distractors: names of other parts of a plant

Type 2 correct response: the function of the part of a plant requested in the stimulus
distractors: functions of other parts of a plant

SAMPLE ITEM: *Type 1*

1. **The part of a plant which anchors it in the soil and stores food is the:**

   A stem.
   • B root.
   C seed.
   D flower.

SAMPLE ITEM: *Type 2*

2. **The root of a plant:**

   A produces the seed.
   B is the part from which it grows.
   C connects the roots with the leaves.
   • D anchors it in the soil and stores food.

OBJECTIVE: 8.2

GRADE 4-6: SCIENCE **GOAL: VERTEBRATES AND INVERTEBRATES**

SKILL: Classify illustrations of common animals as vertebrate or invertebrate.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question such as: Which is a vertebrate (an invertebrate)?

Type 2 a direct question such as: Which drawing below shows a vertebrate (an invertebrate)?

B. Content N/A

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four names of vertebrates and invertebrates listed vertically from short to long

Type 2 four drawings of vertebrates and invertebrates in random order

B. Options

Type 1 correct response: the name of a vertebrate (an invertebrate)
distractors: names of invertebrates (vertebrates)

Type 2 correct response: the drawing of a vertebrate (an invertebrate)
distractors: drawings of invertebrates (vertebrates)

SAMPLE ITEM: *Type 1*

1. Which of the following is an invertebrate?

A dog
B bear
C snake
• D earthworm

2. Which of the following is a vertebrate?

• A cat
B moth
C snail
D butterfly

SAMPLE ITEM: *Type 2*

2. Which drawing below shows an invertebrate?

A

B

• C

D

OBJECTIVE: 9.2

GRADES 4-6: SCIENCE **GOAL: FOOD CHAINS**

SKILL: Distinguish between producer and consumer in a food chain which includes the parasite-host and predator-prey relationships.

STIMULUS ATTRIBUTES:

A.	**Format**	a direct question or incomplete sentence about a particular role played as part of the food chain
B.	**Content**	N/A
C.	**Directions**	N/A

RESPONSE ATTRIBUTES:

A.	**Format**	four words or phrases listed vertically from short to long
B.	**Options**	correct response: the word or phrase requested in the stimulus question distractors: other words or phrases related to the correct response

---

SAMPLE ITEM:

1. **Which is a producer in the food chain?**

   A mammal
   B scavenger
   * C green plant
   D microscopic animal

OBJECTIVE: 10.1

GRADES 4-6: SCIENCE **GOAL: ENVIRONMENT**

SKILL: Choose the definition of the following environmental terms: ecosystem, habitat, community, biome, cycles, population, adaptation and extinction.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence containing a definition and requiring a term to complete the sentence

Type 2 an incomplete sentence containing a term and requiring a definition to complete the sentence

B. Content

Types 1 and 2 terms and definitions from the skill list.

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four terms listed vertically from short to long

Type 2 four definitional phrases listed vertically from short to long

B. Options

Type 1 correct response: the term for the definition in the stimulus
distractors: other terms from the skill list

Type 2 correct response: the definitional phrase for the term in the stimulus
distractors: definitional phrases of other terms from the skill list

---

SAMPLE ITEM: *Type 1*

1. **If a type of animal no longer exists, it is:**

   • **A** extinct.
   B habitat.
   C adaptation.
   D community.

SAMPLE ITEM: *Type 2*

2. **If an animal is extinct, it:**

   A changes habitat.
   B eats only plants.
   •**C** no longer exists.
   D lives in an environment.

OBJECTIVE: 11.1

GRADE 4-6: SCIENCE **GOAL: ROCKS, MINERALS AND FOSSILS**

SKILL: Identify three major types of rocks by characteristics and origin (sedimentary, igneous and metamorphic).

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence describing one of the three major types of rocks or its origin

Type 2 an incomplete sentence or direct question including one of the three major types of rocks and requiring a definition as an answer

B. Content

Types 1 and 2 limited to sedimentary, igneous or metamorphic rock

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format four types of rocks or related nouns listed vertically from short to long

B. Options correct response: the type of rock or noun requested in the stimulus
distractors: other types of rocks or related nouns

SAMPLE ITEM: *Type 1*

1. **A type of rock formed from material such as mud, sand or gravel carried by wind and water is:**

   A fossil.
   B igneous.
   * C sedimentary.
   D metamorphic.

SAMPLE ITEM: *Type 2*

2. **A sedimentary rock is:**

   A formed from material that has cooled.
   B magma that has hardened into rock formations.
   C a type of rock that has been changed by heat.
   * D formed from material such as mud, sand or gravel carried by wind and water.

OBJECTIVE: 11.3

GRADES 4-6: SCIENCE **GOAL: ROCKS, MINERALS AND FOSSILS**

SKILL: Choose a definition of mineral, rock and fossil and recognize relationships that exist among them.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence or direct question giving a definition and requiring a term to complete the sentence

Type 2 an incomplete sentence giving a term and requiring a definition to complete the sentence

B. Content

Types 1 and 2 terms and definitions from the skill list

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four terms related to rocks, minerals or fossils listed vertically from short to long

Type 2 four definitional phrases related to rocks, minerals or fossils listed vertically from short to long

B. Options

Type 1 correct response: the term requested in the stimulus sentence
distractors: other terms related to rocks, minerals or fossils

Type 2 correct response: the definitional phrase requested in the stimulus sentence
distractors: definitional phrases for other terms related to rocks, minerals or fossils

---

SAMPLE ITEM: *Type 1*

1. **An element or compound that is found naturally in the earth's crust is:**

   A lava.
   B fossil.
   • C mineral.
   D rock cycle.

SAMPLE ITEM: *Type 2*

2. **When a scientist finds a fossil, he has found:**

   A a mixture of minerals.
   B the combination of several types of rocks.
   C a chemical compound that forms in nature.
   • D the remains of prehistoric plants or animals.

OBJECTIVE: 12.1

GRADES 4-6: SCIENCE **GOAL: CHANGES IN THE EARTH'S CRUST**

SKILL: Identify definitions for the following factors that change the earth's crust: plate tectonics, continental drift, sea floor rifts and collisions, earthquakes and volcanoes.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question such as: What is an earthquake?

Type 2 an incomplete sentence describing or defining a term and requiring that term to complete the sentence

B. Content

Types 1 and 2 terms and definitions from the skill list

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four phrases (definitions/characteristics) listed vertically from short to long

Type 2 four terms listed vertically from short to long

B. Options

Type 1 correct response: the definition/characteristic requested in the stimulus
distractors: definitions/characteristics of other terms

Type 2 correct response: the term requested in the stimulus
distractors: other terms from the skill list

SAMPLE ITEM: *Type 1*

1. What is an earthquake?

A hot, melted rock
• B shaking of the earth's crust
C an outer layer of the earth's crust
D a place where magma is pushed through the earth's crust

SAMPLE ITEM: *Type 2*

2. A place where magma is pushed through a weak place in the earth's crust is a(n):

• A volcano.
B earthquake.
C plate tectonic.
D continental drift.

OBJECTIVE: 13.1

GRADES 4-6: SCIENCE **GOAL: WEATHER**

SKILL: Identify the following weather terms: highs, lows, fronts, clouds, jet stream, and relative humidity.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence containing a definition or characteristic and requiring a term to complete the sentence

Type 2 a direct question or incomplete sentence requiring a definition/characteristic of a term

B. Content

Types 1 and 2 terms and definitions or characteristics from the skill list

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four words or terms listed vertically from short to long

Type 2 four phrases (definitions/characteristics) listed vertically from short to long

B. Options

Type 1 correct response: the word or term requested in the stimulus sentence
distractors: other words or terms related to the correct response

Type 2 correct response: the phrase requested in the stimulus question
distractors: other phrases related to the correct response

SAMPLE ITEM: *Type 1*

1. The place where two air masses meet describes a:

A low.
B cloud.
* C front.
D jet stream.

SAMPLE ITEM: *Type 2*

2. In a descripton of weather, a front is :

A a drop of water in the air.
B the formation of ice crystals.
C a cloud that looks like a feather.
* D the place where two air masses meet.

OBJECTIVE: 13.2

GRADES: 4-6 SCIENCE **GOAL: WEATHER**

SKILL: Identify weather instruments and interpret their readings (thermometer, barometer, hygrometer, anemometer, rain gauge and radar).

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence containing a definition and requiring a term to complete the sentence

Type 2 an incomplete sentence with an underlined term requiring identification of its function to complete the sentence

Type 3 an illustration of a weather instrument followed by a direct question such as: What is the _____ reading?

B. Content

Type 1, 2, and 3 limited to weather instruments in the skill list

C. Directions

Types 1 and 2 N/A

Type 3 Refer to the illustration to answer question ( ).

RESPONSE ATTRIBUTES:

A. Format

Type 1 four terms listed vertically from short to long

Type 2 four terms or phrases listed vertically from short to long

Type 3 four number readings listed vertically in order of increasing or decreasing magnitude

B. Options

Type 1 correct response: the term requested in the stimulus sentence
distractors: other terms related to the correct response

Type 2 correct response: the term or phrase requested in the stimulus sentence
distractors: other terms or phrases related to the correct response

Type 3 correct response: the numerical reading of the stimulus weather instrument
distractors: numerical readings including + or -1 from the correct response

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SAMPLE ITEM: *Type 1*

1. An instrument which measures temperature is a:

A barometer.
B wind gauge.
C hygrometer.
* D thermometer.

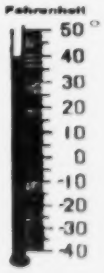
SAMPLE ITEM: *Type 2*

2. A thermometer measures:

A rainfall.
*B temperature.
C water vapor.
D air pressure.

SAMPLE ITEM: *Type 3*

3. What is the temperature reading?



A 20°
B 30°
* C 40°
D 50°

OBJECTIVE: 14.1

GRADES 4-6: SCIENCE **GOAL: UNIVERSE**

SKILL: Choose the definition of the following terms: star, solar system, comet, planet, satellite and asteroid.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence or direct question containing a definition or characteristic and requiring a word or term to complete the sentence

Type 2 an incomplete sentence or direct question with an underlined term such as: What is a _____?

B. Content

Types 1 and 2 terms and definitions or characteristics from the skill list

C. Directions

Types 1 and 2 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four terms from the skill list placed vertically from short to long

Type 2 four phrases (definitions/characteristics) from the skill list placed vertically from short to long

B. Options

Type 1 correct response: the term requested in the stimulus sentence
distractors: other words (terms) related to the correct response

Type 2 correct response: the definition/characteristic requested in the stimulus question
distractors: other words, terms or definitions related to the correct response

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SAMPLE ITEM: *Type 1*

1. **An object in space that revolves around a planet is a(n):**

   A comet.
   B planet.
   C asteroid.
   • D satellite.

SAMPLE ITEM: *Type 2*

2. **A satellite is a(n):**

   A sunspot.
   B burning ball of gas.
   C chunk of iron that moves in space.
   • D object in space that revolves around a planet.

OBJECTIVE: 15.2

GRADES 4-6: SCIENCE **GOAL: NATURAL RESOURCES**

SKILL: Identify natural resources and classify them as renewable and nonrenewable (e.g., water, forest, soil, minerals, wildlife and fossil fuels).

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question such as: Which is (is NOT) a natural resource?

Type 2 a direct question such as: Which is a renewable (NONRENEWABLE) resource?

B. Content N/A

C. Directions N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four examples of natural, man-made and/or human resources listed vertically from short to long

Type 2 four examples of renewable and nonrenewable resources listed vertically from short to long

B. Options

Type 1 correct response: the example requested in the stimulus question
distractors: words or phrases related to the correct response

Type 2 correct response: the example requested in the stimulus question
distractors: words or phrases related to the correct response

---

SAMPLE ITEMS:

1. Which is NOT a natural resource?

A oil
B gas
C coal
•D electricity

2. Which is a NONRENEWABLE natural resource?

•A oil
B tree
C water
D sunlight

OBJECTIVE: 16.1

GRADES 4-6: SCIENCE **GOAL: POLLUTION**

SKILL: Recognize sources of air pollution (automobiles, power plants, industry and natural sources), sources of water pollution (oil slicks, sewage, industrial waste, pesticides and siltation), and sources of land pollution (visual pollution, solid waste and poor usage of land).

STIMULUS ATTRIBUTES:

A. Format a direct question asking for an example of air, water or land pollution

B. Content N/A

C. Directions N/A

RESPONSE ATTRIBUTES:

A. Format four words or phrases listed vertically from short to long

B. Options correct response: the word or phrase requested in the stimulus question
distractors: words or phrases related to the correct response

---

SAMPLE ITEM:

1. Which produces air pollution?

*A traffic on a highway
B garbage thrown in a lake
C an overturned trash barrel at a park
D old, rusty, wrecked cars along the highway

OBJECTIVE: 17.1

GRADES 4-6: SCIENCE **GOAL: WATER CYCLE**

SKILL: Choose the definition of precipitation, condensation and evaporation and identify them on a water cycle diagram.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a labeled illustration depicting the water cycle followed by a direct question such as: Which is the CORRECT sequence?

Type 2 an incomplete sentence or direct question containing an underlined term and requiring a definition to complete the sentence

Type 3 an incomplete sentence or direct question defining part of the water cycle and requiring a term to complete the sentence

B. Content N/A

C. Directions

Type 1 Refer to the illustration to answer question ( ).

Types 2 and 3 N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four sets of three words listed vertically from short to long

Type 2 four phrases listed vertically from short to long

Type 3 four terms from the water cycle or related areas listed vertically from short to long

B. Options

Type 1 correct response: the set of words describing the sequence in the water cycle
distractors: sets of water cycle terms in varying order

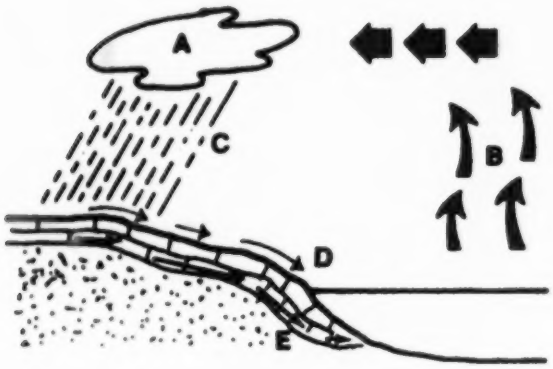
Type 2 correct response: the phrase which defines the underlined word in the stimulus sentence
distractors: phrases related to the correct response

Type 3 correct response: the term requested in the stimulus sentence
distractors: terms related to the correct reponse

OBJECTIVE: 17.1 (cont.)

SAMPLE ITEM: ***Type 1***

Which is the CORRECT sequence?



1. **Which is the CORRECT sequence?**

   A precipitation, condensation, evaporation
   * B condensation, precipitation, evaporation
   C evaporation, precipitation, condensation
   D condensation, evaporation, precipitation

SAMPLE ITEM: ***Type 2***

2. **<u>Precipitation</u> is:**

   * A water falling to the earth.
   B an instrument to measure rainfall.
   C water changing from a liquid to a gas.
   D water changing from a gas to a liquid.

SAMPLE ITEM: ***Type 3***

3. **Water falling to the earth is called:**

   A barometer.
   B evaporation.
   C condensation.
   * D precipitation.

OBJECTIVE: 18.3

GRADES 4-6: SCIENCE **GOAL: MATTER**

SKILL: Distinguish between physical and chemical change.

STIMULUS ATTRIBUTES:

A. Format a direct question asking for an example of a physical or chemical change

B. Content common examples such as: wood burning, sugar dissolving in water, water freezing, pencil breaking, etc.

C. Directions N/A

RESPONSE ATTRIBUTES:

A. Format four phrases listed vertically from short to long

B. Options correct response: the example of a physical or chemical change requested in the stimulus question
distractors: examples of other chemical or physical changes

SAMPLE ITEMS:

1. Which is NOT a chemical change?

A a car rusting
B burning trash
•C rain falling from the clouds
D making carbon dioxide from vinegar and baking soda

2. Which can be used as evidence of a chemical change?

A change in size
B change in form
• C change in color
D change in shape

OBJECTIVE: 19.1

GRADES 4-6: SCIENCE **GOAL: ELEMENTS, MIXTURES AND COMPOUNDS**

SKILL: Select the definition of elements, mixtures and compounds.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence which includes a definition or example defining element, mixture or compound and requiring selection of a term to complete the sentence

Type 2 an incomplete sentence containing an underlined term and requiring selection of a definition to complete the sentence

RESPONSE ATTRIBUTES:

A. Format

Type 1 four terms listed vertically from short to long

Type 2 four phrases listed vertically from short to long

B. Options

Type 1 correct response: the term requested in the stimulus sentence
distractors: other terms related to the correct response

Type 2 correct response: the definition of the stimulus term
distractors: other definitions related to the correct response

---

SAMPLE ITEM: *Type 1*

1. Matter made up of only one kind of atom is a(n):

A rock.
*B element.
C mixture.
D compound.

SAMPLE ITEM: *Type 2*

2. An element is:

A a solution of sugar and water.
*B matter made up of only one kind of atom.
C matter that is made up of two or more kinds of atoms.
D material that is made by physically combining several types of atoms.

OBJECTIVE: 21.1

GRADES 4-6: SCIENCE **GOAL: AIR**

SKILL: Identify the major gas components of air and their proportions.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question relating to proportions of gases in air such as: _____ is what part of air?

Type 2 an incomplete sentence containing a proportion such as: MOST of the air is ( ):

B. Content

Types 1 and 2 oxygen/nitrogen proportions

C. Directions N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four proportions listed vertically from short to long

Type 2 four gases listed vertically from short to long

B. Options

Type 1 correct response: the proportion requested in the stimulus question
distractors: other proportions

Type 2 correct response: the gas requested in the stimulus sentence
distractors: other gases

SAMPLE ITEM: *Type 1*

1. Oxygen is what part of air?

A none
B about half
•C about one-fifth
D about three-fourths

SAMPLE ITEM: *Type 2*

2. MOST of the air is:

A argon.
B oxygen.
• C nitrogen.
D carbon dioxide.

OBJECTIVE: 22.1

GRADES 4-6: SCIENCE **GOAL: SOURCES OF ENERGY**

SKILL: Match the source of energy (i.e., oil, natural gas, coal, nuclear, solar, water, wind, food, alcohol and geothermal) to an illustration of its use.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an illustration (written or graphic) followed by a direct question such as: Which type of energy is being used?

Type 2 an incomplete sentence or a direct question referring to energy use

B. Content N/A

C. Directions

Type 1 Refer to the illustration to answer question _____.

RESPONSE ATTRIBUTES:

A. Format

Type 1 four words or phrases listed vertically from short to long

Type 2 four words or phrases listed vertically from short to long

B. Options

Type 1 correct response: the word or phrase requested in the stimulus question
distractors: other words or phrases related to the correct response

Type 2 correct response: the word or phrase requested in the stimulus question
distractors: other words or phrases related to the correct response

---

SAMPLE ITEM: *Type 1*

1. **Which type of energy is produced by using steam that is formed when ground water comes in contact with hot volcanic rock?**

   A solar
   B nuclear
   *C geothermal
   D hydroelectric

SAMPLE ITEM: *Type 2*

2. **The sun is MOST LIKELY used to:**

   A run a train.
   *B heat a solar panel.
   C turn a water wheel.
   D power a nuclear plant.

OBJECTIVE: 23.1

GRADES 4-6: SCIENCE **GOAL: HEAT**

SKILL: Distinguish among the three ways in which heat travels (i.e., conduction, convection and radiation).

STIMULUS ATTRIBUTES:

A. Format

Type 1 an illustration of one of the ways in which heat travels followed by an incomplete sentence or direct question seeking cause and effect

Type 2 a direct question or an incomplete sentence such as: A metal rod heated by a candle flame, becomes hot because of:

B. Content N/A

C. Directions

Type 1 Use the illustration to answer question ( ).

RESPONSE ATTRIBUTES:

A. Format four words or phrases listed vertically from short to long

B. Options correct response: the word or phrase requested in the stimulus
distractors: other words or phrases related to the correct response

---

SAMPLE ITEM: ***Type 1***

Use the illustration to answer question 1.

1. The metal rod becomes hot because of:

A radiation.
B convection.
C insulation.
* D conduction.

SAMPLE ITEM: ***Type 2***

2. A metal rod heated by a candle flame becomes hot because of:

A radiation.
B insulation.
C convection.
* D conduction.

OBJECTIVE: 24.2

GRADES 4-6: SCIENCE **GOAL: ELECTRIC CIRCUITS**

SKILL: Trace the electron flow through a direct current circuit.

STIMULUS ATTRIBUTES:

A. Format a direct question such as: Which ____ will cause ____?

B. Content
1. illustration using typical batteries and bulb holders.
2. circuits labeled A, B, C, D.

C. Directions N/A

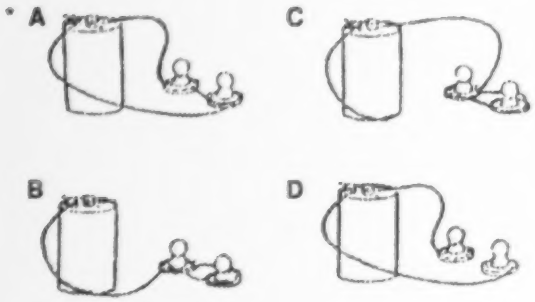
RESPONSE ATTRIBUTES:

A. Format four letters (A, B, C, D) with illustrations

B. Options correct response: the letter of the complete circuit
distractors: letters representing incomplete circuits

SAMPLE ITEM:

1. Which circuit will light the bulb?



OBJECTIVE: 25.2

GRADES 4-6: SCIENCE **GOAL: ELECTROMAGNETISM**

SKILL: Recognize a properly constructed electromagnet.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question asking for a description of an electromagnet

Type 2 an illustration depicting an electromagnet followed by a direct question related to cause and effect

Type 3 an illustration depicting materials needed to make an electromagnet embedded in an incomplete sentence

B. Content

Type 2 illustration of a common electromagnet use such as magnetic crane, door bell, etc.

Type 3 embedded illustration including battery, nail and wire

C. Directions Refer to the illustration to answer question ( ).

RESPONSE ATTRIBUTES:

A. Format

Type 1 four illustrations or four sentences listed vertically from short to long

Type 2 four sentences listed vertically from short to long

Type 3 four illustrations in random order

B. Options

Type 1 correct response: the illustration or sentence requested in the stimulus question
distractors: other plausible illustrations or related sentences

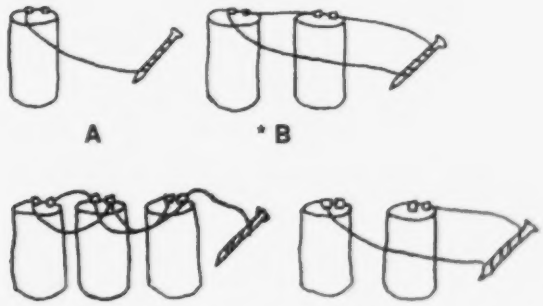
Type 2 correct response: the sentence requested in the stimulus sentence
distractors: other plausible sentences

Type 3 correct response: the illustration requested in the stimulus sentence
distractors: illustrations of improperly constructed electromagnets

---

SAMPLE ITEM: *Type 1*

1. Which is an electromagnet?



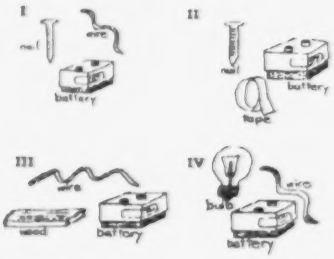
A * B

C D

SAMPLE ITEM: *Type 2*

Refer to the illustration to answer question 2.

2. Which of the following contains the materials necessary to construct an electromagnet?



* A I
B II
C III
D IV

OBJECTIVE: 26.2

GRADES 4-6: SCIENCE **GOAL: ELECTRICAL INSULATORS AND CONDUCTORS**

SKILL: Identify materials as insulators or conductors (e.g., rubber, plastic, copper, etc.).

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence

Type 2 a direct question such as: Which is a(n) _____?

B. Content N/A

C. Directions N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four phrases listed vertically from short to long

Type 2 four illustrations in random order

B. Options

Type 1 correct response: the phrase which correctly completes the stimulus sentence
distractors: other phrases which fit the stimulus sentence gramatically

Type 2 correct response: the illustration requested in the stimulus question
distractors: other related illustrations

SAMPLE ITEM: ***Type 1***

1. The plastic coating on this electrical wire:

A makes the wire look nice.
B keeps the wire from breaking.
• C insulates the wire to prevent shock.
D keeps the wire from becoming tangled.

SAMPLE ITEM: ***Type 2***

2. Which is an insulator?

A steel
B water
• C rubber
D paper clip

OBJECTIVE: 27.1

GRADES 4-6: SCIENCE **GOAL: CONCAVE AND CONVEX LENSES**

SKILL: Distinguish between concave and convex lenses.

STIMULUS ATTRIBUTES:

A. Format

Type 1 a direct question requiring identification of a concave/convex object

Type 2 a direct question or an incomplete sentence such as: A lens that makes things look larger is:

B. Content N/A

C. Directions N/A

RESPONSE ATTRIBUTES:

A. Format

Type 1 four objects placed in random order

Type 2 four words listed vertically from short to long

B. Options

Type 1 correct response: the object requested in the stimulus question
distractors: other objects, one of which is the opposite of the correct response

Type 2 correct response: the term requested in the stimulus question
distractors: other terms related to the skill

SAMPLE ITEM: Type 1

1. Which piece of glass is a concave lens?

A

B

• C

D

SAMPLE ITEM: Type 2

2. A lens that makes things look larger is:

• **A** convex.
B opaque.
C concave.
D reflecting.

OBJECTIVE: 28.1

GRADES 4-6: SCIENCE **GOAL: REFLECTION AND REFRACTION OF LIGHT**

SKILL: Identify reflection and refraction.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an illustration followed by an incomplete sentence describing the visual effect of reflection or refraction

Type 2 a direct question regarding examples of reflection or refraction such as: Which is an example of refraction?

B. Directions

Type 1 Use the illustration to answer question ( ).

RESPONSE ATTRIBUTES:

A. Format

Type 1 four terms or phrases listed vertically from short to long

Type 2 four illustrations in random order

B. Options

Type 1 correct response: the term or phrase requested in the stimulus sentence
distractors: other terms or phrases relating to the correct response

Type 2 correct response: the illustration requested in the stimulus question
distractors: other illustrations relating to the correct response

---

SAMPLE ITEM: Type 1

Use the illustration to answer question 1.

1. A straw in the glass of water appears bent because of:

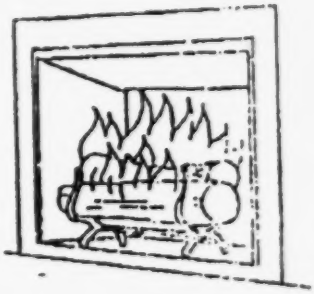
- * **A** refraction.
- **B** reflection.
- **C** transmission.
- **D** being opaque.

SAMPLE ITEM: Type 2

2. Which drawing demonstrates reflection?

* **A**

B



C

D

OBJECTIVE: 30.1

GRADES 4-6: SCIENCE **GOAL: MACHINES**

SKILL: Identify force, energy, mass, inertia, work, friction and gravity.

STIMULUS ATTRIBUTES:

A. Format

Type 1 an incomplete sentence containing an underlined term and requiring selection of an example to complete the sentence

Type 2 an incomplete sentence focusing on cause and effect

Type 3 objects illustrative of one of the skill concepts followed by a directive such as: Rank _____ in order from _____ to _____.

B. Content

Type 3 drawings numbered for identification

C. Directions

Type 3 Refer to the drawings below; then answer question ( ).

RESPONSE ATTRIBUTES:

A. Format

Type 1 four phrases/examples from the skill list placed vertically from short to long

Type 2 four terms from the skill list placed vertically from short to long

Type 3 four sets of numbers of the illustrated objects listed vertically in random order

B. Options

Type 1 correct response: the phrase/example requested in the stimulus sentence
distractors: other phrases/examples relating to the correct response

Type 2 correct response: the term requested in the stimulus sentence
distractors: other terms or words relating to the correct response

Type 3 correct response: the set of numbers requested in the stimulus question
distractors: other sets of the same numbers

OBJECTIVE: 30.1 (cont.)

SAMPLE ITEM: *Type 1*

1. Which is an example of <u>inertia</u>?

A A horse pulls a wagon.
B An apple falls to the ground.
C Your hands get warm when you rub them on a table.
•D Johnny sails over the top of his bicycle when he hits a fence.

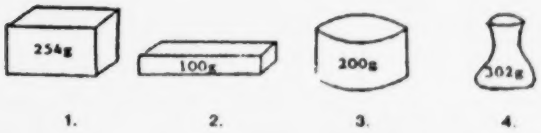
SAMPLE ITEM: *Type 2*

2. Walking on a dry surface is safer than walking on a wet surface because of:

A energy.
B gravity.
C inertia.
•D friction.

SAMPLE ITEM: *Type 3*

Refer to the drawings below; then answer question 3.



3. Rank from SMALLEST to GREATEST mass.

A 1, 2, 3, 4
B 3, 1, 4, 2
C 2, 3, 4, 1
• D 2, 3, 1, 4

OBJECTIVE: 30.2

GRADES 4-6: SCIENCE **GOAL: MACHINES**

SKILL: Identify simple and compound machines.

STIMULUS ATTRIBUTES:

A. Format

Type 1 four numbered illustrations of machines followed by a direct question requiring identification of a simple or compound machine shown in an illustration

Type 2 a direct question requiring identification

B. Content

Types 1 and 2 Limited to: screw, wedge, pulley, inclined plane, wheel and axle

C. Directions

Type 1 Refer to the drawings; then answer question ( ).

RESPONSE ATTRIBUTES:

A. Format

Type 1 four numbers corresponding to the illustration in ascending or descending order

Type 2 four illustrations in random order

B. Options

Type 1 correct response: the term requested in the stimulus question
distractors: other terms or related words

Type 2 correct response: the illustration requested in the stimulus question
distractors: other illustrations relating to the correct response

---

SAMPLE ITEM: *Type 1*

Refer to the drawings; then answer question 1.

1. Which is a compound machine?

A

• B

C

D

SAMPLE ITEM: *Type 2*

2. A see-saw is an example of what machine?

• A lever
B wedge
C pulley
D inclined plane

END

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